

**TECHNICAL REVIEW DOCUMENT**  
**For**  
**RENEWAL / MODIFICATION TO OPERATING PERMIT 00OPMR224**

BIV Generation Company, LLC  
Morgan County  
Source ID 0870027

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November 2006 and January 2008  
Revised April and August 2008

**I. Purpose:**

This document establishes the basis for decisions made regarding the applicable requirements, emission factors, monitoring plan and compliance status of emission units covered by the renewal and modification of the Operating Permit for the Brush 4 facility. The current Operating Permit for this facility was issued on September 1, 2002. The expiration date for the permit was September 1, 2007. However, since a timely and complete renewal application was submitted, under Colorado Regulation No. 3, Part C, Section IV.C all of the terms and conditions of the existing permit shall not expire until the renewal operating permit is issued and any previously extended permit shield continues in full force and operation. Prior to submittal of the renewal application, the source had submitted an application on March 22, 2006 to revise their Title V permit to set higher alternative BACT limits for startup and shutdown. Since this modification changes a case-by-case emission limitation, the modification must be processed as a significant modification as required by Colorado Regulation No. 3, Part C, Section I.A.7.c. A significant modification is processed under the same procedures as a renewal, i.e. it must go through a 30-day public comment period and EPA 45-day review period. Therefore, since the renewal application has been submitted the Division is incorporating the modification with the renewal.

This document is designed for reference during review of the proposed permit by EPA and for future reference by the Division to aid in any additional permit modifications at this facility. The conclusions made in this report are based on the source's request for a modification submitted on March 22, 2006, the renewal application submitted on June 19, 2006, additional information submitted on June 28, 2006 (to supplement the renewal application) and December 5, 2007, comments on the draft permit submitted on May 14, 2008, previous inspection reports and various e-mail correspondence, as well as telephone conversations with the applicant. Please note that copies of the Technical Review Document for the original permit and any Technical Review Documents associated with subsequent modifications of the original Operating Permit may be found in the Division files as well as on the Division website at <http://www.cdphe.state.co.us/ap/Titlev.html>.

This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

## **II. Description of Source**

This facility consists of two combustion turbines, each equipped with a heat recovery steam generator (HRSG) and duct burner, which are used to generate power during peak periods and is defined under Standard Industrial Classification 4911. These combustion turbines, HRSGs and duct burners are part of the Brush Cogeneration Facility. A separate Operating Permit has been issued for each operating company, however, for permitting purposes the Brush Cogeneration Facility is considered one stationary source. The turbines are equipped with water injection systems to control nitrogen oxide emissions. Each combustion turbine serves a generator with a nameplate capacity of 28.5 MW. The waste heat from each of these units flows through a HRSG (equipped with a duct burner to provide additional heat) to generate steam, which is used to drive a steam turbine (90 MW) to generate additional electricity. The installation of a bypass damper allows the combustion turbines to also operate in simple cycle mode (i.e turbine only). There is also a cooling tower to cool water for the steam turbine. The combustion turbines/HRSGs/duct burners are referred to as GT-4 and GT-5. Note that in the underlying construction permit these units were also referred to as Brush Turbine 4A and 4B and CEM Turbine 1 and 2.

Based on the information available to the Division and provided by the applicant, it appears that no modifications to the significant emission units has occurred since the original issuance of the operating permit.

The facility is located in a 90 acre industrial area shared with the greenhouse and is just south of Brush. The area in which the plant operates is designated as attainment for all criteria pollutants.

There are no affected states within 50 miles of the plant and there are no Federal Class I designated areas within 100 kilometers of the plant.

The summary of emissions that was presented in the Technical Review Document (TRD) for the original permit issuance has been modified to more appropriately identify the potential to emit (PTE) since modifications have been made to the Brush Cogeneration Partnership (BCP) emission units, as well as the other emission units at the Brush Cogeneration Facility. Emissions (in tons/yr) at the facility are as follows:

Emission Unit	PM	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC	HAPS
BCP – Turbine*	5.1	5.1	1.2	105.7	44	32	See Table on Page 18
BCP – Duct Burner							
BCP - Engine							
BCP – Cooling Tower	4.4	4.4					
<b>BCP Total Emissions</b>	<b>9.5</b>	<b>9.5</b>	<b>1.2</b>	<b>105.7</b>	<b>44</b>	<b>32</b>	<b>4.14</b>
CPP – Turbines*	5	5	3.4	134	147.5	24.2	See Table on Page 18
CPP – Duct Burners							
CPP – Engines							
CPP – Cooling Tower	2.5	2.5					<b>8.02</b>
<b>CPP Total Emissions</b>	<b>7.5</b>	<b>7.5</b>	<b>3.4</b>	<b>134</b>	<b>147.5</b>	<b>24.2</b>	
BIV – Turbines**	9.71	9.71	2.79	60	120	22.38	See Table on Page 18
BIV – Duct Burners							
BIV – Cooling Towers	6.87	6.87					
<b>BIV Total Emissions</b>	<b>16.58</b>	<b>16.58</b>	<b>2.79</b>	<b>50</b>	<b>120</b>	<b>22.38</b>	<b>6.12</b>
Brushco – Boilers				5	4.2		See Table on Page 18
Brushco – Boilers				11.5	9.7		
<b>Brushco Total Emissions</b>				<b>16.5</b>	<b>13.9</b>		<b>0.32</b>
<b>Facility Total Emissions</b>	<b>33.58</b>	<b>33.58</b>	<b>7.39</b>	<b>316.2</b>	<b>325.4</b>	<b>78.58</b>	<b>18.60</b>

\*permitted emissions for the turbine(s), duct burner(s) and starter engine(s) is a combined limit.

\*\*permitted emissions for the turbines and duct burners is a combined limit.

Potential to Emit is based on permitted emission limits. Based on APENs filed for 2005 data (APENs received on March 22, 2006), actual emissions from Brush 4A and 4B were 5.5 tons/yr of NO<sub>x</sub> and 6.7 tons/yr of CO, each. All other criteria pollutant emissions were less than 1 ton/yr for each turbine.

The breakdown of HAP emissions by emission unit and individual HAP is provided on page 18 of this document. Since the HAP emissions, on an hourly basis, are higher for

the turbines than the duct burners, the HAP PTE is based on the turbines burning all the fuel (fuel consumption limits typically apply to the turbine(s) and duct burner(s) combined). For the BCP turbine, the turbine can run 8760 hrs/yr and there is leftover fuel for the duct burner to operate; therefore, HAP emissions for both the turbine and duct burner were calculated. HAP emissions for all equipment, except the turbines, are based on AP-42 emission factors. For the turbines, HAP emissions are based on the higher emission factor from either AP-42, California Air Toxic Emission Factors (CATEF) or EPA's August 22, 2003 memo on HAP emission factors for turbines.

### MACT Requirements

#### Case-by-Case MACT - 112(j) (40 CFR Part 63 Subpart B §§ 63.50 thru 63.56)

Under the federal Clean Air Act (the Act), EPA is charged with promulgating maximum achievable control technology (MACT) standards for major sources of hazardous air pollutants (HAPs) in various source categories by certain dates. Section 112(j) of the Act requires that permitting authorities develop a case-by-case MACT for any major sources of HAPs in source categories for which EPA failed to promulgate a MACT standard by May 15, 2002. These provisions are commonly referred to as the "MACT hammer".

Owner or operators that could reasonably determine that they are a major source of HAPs which includes one or more stationary sources included in the source category or subcategory for which the EPA failed to promulgate a MACT standard by the section 112(j) deadline were required to submit a Part 1 application to revise the operating permit by May 15, 2002. The source submitted a notification but the cover letter for the notification indicated that they did not believe that HAP emissions from the facility were above the major source level (10 tons per year of any single HAP or greater than 25 tons per year of all HAPs combined), but requested that the Division indicate whether the source is major for HAPS. Based on the Division's analysis, the Brush Cogeneration Facility is a major source of HAPS for a covered source category (combustion turbine, reciprocating internal combustion engines (RICE) and industrial, commercial and institutional boilers and process heaters). Since the EPA has signed off on final rules for all of the source categories, which were not promulgated by the deadline, the case-by-case MACT provisions in 112(j) no longer apply. Note that there is a possible exception to this, as discussed later in this document (see under industrial, commercial and institutional boiler and process heaters).

#### Combustion Turbine MACT (40 CFR Part 63 Subpart YYYY)

In accordance with 40 CFR Part 63 Subpart YYYY § 63.6090(b)(4), existing (construction commenced prior to January 14, 2003) stationary combustion turbines do not have to meet the requirements of Subparts A and YYYY, including the initial notification requirements.

#### RICE MACT (40 CFR Part 63 Subpart ZZZZ)

The RICE MACT (40 CFR Part 63 Subpart ZZZZ) was signed as final on February 26, 2004 and was published in the Federal Register on June 15, 2004. An affected source under the RICE MACT is any existing, new or reconstructed stationary RICE with a site-rating of more than 500 hp; however, only existing (commenced construction or reconstruction prior to December 19, 2002) 4-stroke rich burn (4SRB) engines with a site-rating of more than 500 hp were subject to requirements. Existing (commenced construction or reconstruction prior to December 19, 2002) compression ignition (CI) engines, 2-stroke lean burn (2SLB) and 4-stroke lean burn (4SLB) engines were not subject to any requirements in either Subparts A or ZZZZ (40 CFR Part 63 Subpart ZZZZ § 63.6590(b)(3)).

In addition, revisions were made to the RICE MACT to address engines  $\leq 500$  hp and engines at area sources. These revisions were published in the federal register on January 18, 2008. Under these revisions, existing 4SRB, 2SLB, 4SLB and CI engines are exempt from the requirements. For purposes of the MACT, for engines  $\leq 500$  hp, existing means commenced construction or reconstruction before June 12, 2006. There are no engines associated with this permit that are addressed in Section II and therefore considered significant emission units. There are engines addressed in the insignificant activity list (a 44 hp diesel fired engine used to drive the portable welding unit); however, this engine commenced construction prior to June 12, 2006 and as a result the requirements in the RICE MACT do not apply.

#### Industrial, Commercial and Institutional Boilers and Process Heaters MACT (40 CFR Part 63 Subpart DDDDD)

The final rule for industrial, commercial and institutional boilers and process heaters was signed on February 26, 2004 and was published in the Federal Register on September 13, 2004. There are process heaters included in the insignificant activity list in Appendix A of the permit. Although 40 CFR Part 63 Subpart DDDDD applies, existing (constructed before January 13, 2003) small gaseous fired units are not subject to any of the requirements in 40 CFR Part 63 Subparts A and DDDDD, including the initial notification requirements (§ 63.7506(c)(3)). The process heaters at this facility that are listed in the insignificant activity list would fall under the existing small gaseous fired unit category and would therefore not be subject to any requirements.

In addition, there are duct burners associated with both of the combustion turbines that are considered significant emission units. In accordance with the provision in 40 CFR Part 63 Subpart DDDDD § 63.7491(c), the provisions in Subpart DDDDD do not apply to electric utility steam generating units (EUSGU), which is a fossil fuel-fired combustion unit of more than 25 MW that serves a generator that produces electricity for sale. A fossil fuel-fired unit that cogenerates steam and electricity, and supplies more than one-third of its potential electric output capacity, and more than 25 MW electrical output to any utility power distribution system for sale is considered an electric utility steam generating unit. Neither of these units is used as cogeneration units and each turbine by itself generates more than 25 MW of electricity. Therefore, these units qualify as

EUSGUs and are therefore, not subject to the requirements in 40 CFR Part 63 Subpart DDDDD.

As of July 30, 2007, the Boiler MACT was vacated; therefore, the provisions in 40 CFR Part 63 Subpart DDDDD are no longer in effect and enforceable. The vacatur of the Boiler MACT triggers the case-by-case MACT requirements in 112(j), referred to as the MACT hammer, since EPA failed to promulgate requirements for the industrial, commercial and institutional boilers and process heaters by the deadline. Under the 112(j) requirements (codified in 40 CFR Part 63 Subpart B §§ 63.50 through 63.56) sources are required to submit a 112(j) application by the specified deadline. As of this date, EPA has not set a deadline for submittal of 112(j) applications to address the vacatur of the Boiler MACT. It is not clear whether 112(j) applications would be required for the small process heaters that were affected sources under the Boiler MACT but were not subject to any requirements. Nor is it clear whether 112(j) applications would be required for emission units, such as EUSGUs, which were excluded from the Boiler MACT but are considered affected facilities under the NSPS for industrial-commercial-institutional steam generators. Therefore, the Division has not included a requirement in the permit to submit a 112(j) application. If the Division considers that in the future, a 112(j) application will be required for small units and EUSGUs the source will be notified.

### CAM Requirements

CAM requirements were included for the turbines upon initial Title V permit issuance, pursuant to 40 CFR Part 64 § 64.5(a)(1)(i), since the Title V permit application was not filed prior to April 20, 1998 and controlled emissions were above the major source level.

In processing this renewal application, the Division has determined that including the CAM requirements in the initial Title V permit was not appropriate. It is true that at the time the initial application was submitted (April 27, 2000) permitted emissions (which includes controls) for NO<sub>x</sub> were at 100 tons/yr, which would mean that the CAM plan should have been submitted with the original Title V permit application. However, the initial approval construction permit issued for these units (98MR0727, issued May 25, 1999), included provisions to drop the NO<sub>x</sub> limit to 83.3 tons/yr after the first 24 months of operation. The Division is not aware that there is a "once in always in" policy for CAM, so a source could reduce their permitted emission rate and avoid CAM. In this particular case, as a requirement in the underlying construction permit, permitted NO<sub>x</sub> emissions would drop below 100 tons/yr within 24 months of operation. The revised construction permit (issued February 21, 2001) clarified that the 83.3 tons/yr NO<sub>x</sub> limit would take effect on July 1, 2001. The draft Title V permit went to public comment in March 2002 and at that time permitted emissions of NO<sub>x</sub> were at 83.3 tons/yr. At that level of emissions, the CAM plan would have been due with the Title V renewal application (40 CFR Part 64 § 64.5(b), as adopted by reference in Colorado Regulation No. 3, Part C, Section XIV) and because the original Title V permit would have (and did) require the source to use a NO<sub>x</sub> continuous emission monitoring system (CEMS) to monitor compliance with both the annual and short-term (BACT) NO<sub>x</sub> limits, the units

would have been exempt from CAM at renewal, since a Title V permit specified a continuous compliance determination method (40 CFR Part 64 § 64.2(b)(vi), as adopted by reference in Colorado Regulation No. 3, Part C, Section XIV). Therefore, since the Division considers that the CAM requirements were inappropriately included in the original Title V permit and because the units have a Title V permit that specifies a continuous compliance demonstration method, CAM would not be required at renewal. Therefore, the CAM requirements have been removed for the turbines.

Although the cooling water tower is equipped with drift eliminators, drift eliminators are not considered control devices as defined in 40 CFR Part 64 § 64.1, as adopted by reference in Colorado Regulation No. 3, Part C, Section XIV, since the drift eliminators act as a passive control measure to prevent the release of pollutants (i.e. drift).

### **III. Discussion of Modifications Made**

#### **Source Requested Modifications**

The source's requested modifications identified in the modification request and the renewal application were addressed as follows:

#### **Page following cover page**

In their March 22, 2006 modification request, the source indicated new addresses and contact information for the permit contact and the responsible official. The permit was revised to reflect the responsible official's new title and phone number and to reflect the permit contact's new phone number. In addition the address under "issued to" was revised based on the information provided in the source's December 5, 2007 submittal. The address in the current permit is for a former owner.

In their comments on the draft permit received on May 14, 2008, the source requested that the Responsible Official be changed. This change has been made as requested.

#### **NSPS Subpart Da NO<sub>x</sub> Limit Requirements**

In their March 22, 2006 application, which is referenced in their renewal application, the source requested that the permit be revised to specify that compliance with the NSPS Da NO<sub>x</sub> limit for the duct burners be monitored by conducting an annual performance test as specified in paragraph 16 of a Compliance Order on Consent (2004-033, signed June 16, 2005) issued for this permit. Although the Compliance Order directs the source to submit a permit application to revise their permit to specify that compliance with the NSPS Da NO<sub>x</sub> limit be monitored through an annual stack test, the Division considers that requiring an annual stack test when the unit is equipped with a continuous emission monitoring system (CEMS) for that pollutant is not appropriate. Nevertheless, the Division believes that the NSPS Da limit may be less stringent than the NO<sub>x</sub> BACT limits for these units and if that is the case then the NSPS Da NO<sub>x</sub> limit can be streamlined out of the permit in favor of the NO<sub>x</sub> BACT limit.

The NSPS Da NO<sub>x</sub> limit is 1.6 lb/MW-hr, on a 30-day rolling average (40 CFR Part 60 Subpart Da § 60.44Da(d)(1)). As specified in 40 CFR Part 60 Subpart Da § 60.48Da(c), the NSPS NO<sub>x</sub> limits are not applicable during periods of startup, shutdown and malfunction. The NO<sub>x</sub> BACT limit for this unit is 25 ppmvd NO<sub>x</sub> at @ 15% O<sub>2</sub>, on a 1-hr average (note that since the NSPS Da NO<sub>x</sub> limits do not apply during periods of startup and shutdown, the startup and shutdown NO<sub>x</sub> BACT limits do not need to be included in this demonstration). The NO<sub>x</sub> BACT emission limitations must be converted to the same units as the NSPS Da limit for comparison. Using EPA method 19, Equation 19-1, the NO<sub>x</sub> BACT limit was converted to units of lb/mmBtu, which results in a NO<sub>x</sub> BACT limit of 0.0921 lb/mmBtu.

Although the duct burner would not operate if the turbine isn't operating, the NSPS Da limit applies to the duct burner only, so for purposes of this demonstration, only the duct burner will be evaluated. Assuming that only the duct burner was operating at maximum load, the NO<sub>x</sub> BACT emission limitation would be 27.6 lbs/hr (0.0921 lb/mmBtu x 300 mmBtu/hr). At this emission rate, the power generated by the steam turbine load must be above 17.25 MW in order for the BACT limit to be more stringent than the NSPS Da limit of 1.6 lb/MW-hr. Again, assuming operation of the duct burner at its design rate (300 mmBtu/hr) and an efficiency of 33%, the power generated by the duct burner would be 29.2 MW, which would result in an emission rate of 0.94 lb/MW-hr, which is less stringent than the NO<sub>x</sub> BACT limit. Although the duct burner could be operated at a lower load, this would also mean a reduction of the lbs/hr emission rate, as well as the power produced from the duct burner. In addition, it should be noted that the averaging time for the NO<sub>x</sub> BACT limit is more stringent than the NSPS Da NO<sub>x</sub> limit (one-hour average vs 30-day rolling average). Therefore, the Division considers that the NO<sub>x</sub> BACT limit is more stringent than the NSPS Da NO<sub>x</sub> limit. Therefore, the Division will streamline out the NSPS Da NO<sub>x</sub> limit in favor of the NO<sub>x</sub> BACT limit.

Note that NSPS Da specifies that compliance with the NSPS limits for duct burners may be demonstrated with a performance test, rather than a NO<sub>x</sub> CEMS. NSPS Da specifically states that duct burners are not required to have NO<sub>x</sub> CEMS (40 CFR Part 60 Subpart Da § 60.49Da(o)). Since the source has demonstrated compliance with the NSPS Da NO<sub>x</sub> limit with a performance test, the NSPS NO<sub>x</sub> CEMS requirements do not apply to the duct burner and therefore need not be considered further for purposes of streamlining.

The current permit includes monitoring and reporting requirements for the NSPS Da NO<sub>x</sub> limit, since the Division had previously presumed that the source would use their NO<sub>x</sub> CEMS to demonstrate compliance with the NSPS Da NO<sub>x</sub> limit. Since the NSPS Da NO<sub>x</sub> limit will be streamlined out of the permit in favor of the NO<sub>x</sub> BACT limit, the monitoring and reporting requirements associated with the NSPS Da NO<sub>x</sub> limit will be removed from the permit also.

#### Data Acquisition and Handling System (DAHS) Hourly Data Validation



The source requested in their March 22, 2006 application, which is referenced in their renewal application, that the permit be revised to specify that hours shall be validated in accordance with the provisions in 40 CFR Part 75 § 75.10(d), as required by paragraph 15, of a Compliance Order on Consent (2004-033, signed June 16, 2005) issued for this permit. The source suggested that language be added to Section II, Conditions 1.4.1 and 1.5.1 to address the valid hour definition. However, the Division considers that this language would be more appropriate to include these requirements in the permit with the CEMS requirements (Section II.3). The Division has included language in the permit in Section II.3 indicating that valid hours shall be determined in accordance with the requirements in § 75.10(d).

#### DAHS/CEMS Data Quality Assurance/Quality Control (QA/QC)

In their March 22, 2006 application, which is referenced in the renewal application, the source included a discussion regarding the specific QA/QC requirements for the CEMS. Typically the Division has not been overly specific on the CEMS and have typically just indicated that the CEMS shall meet either the requirements of 40 CFR Part 60 or Part 75. In this case, the Division will include some more specific requirements for the CEMS at this facility. Therefore, the CEMS requirements have been revised to address some of the more specific provisions noted in the source's application. These revisions have been made to Section II.3 (CEMS requirements).

In addition, in their comments on the draft permit (received on May 14, 2008), the source requested that language be added indicating that the file format required by Section II, Condition 3.2.5 be either hardcopy, electronic or combination.

#### Startup/Shutdown BACT Limits

In their March 22, 2006 application, which is referenced in the renewal application, the source requested a revision to their startup and shutdown BACT limits. The current permit includes startup and shutdown BACT limits in units of ppmvd and the source is requesting that a lbs/hr limit be added to the current limit. Under the source's proposed startup and shutdown BACT limit, if the source were out of compliance with the ppmvd limit, the mass emission rate (lbs/hr) for that hour would be compared to the proposed new lbs/hr BACT limit to determine if the unit is out of compliance. In order to be out of compliance, the unit would have to exceed both the ppmvd limit and the proposed new lbs/hr limit. This type of dual startup/shutdown BACT limit has been used for the Ft. St. Vrain turbines. The Division has agreed to include an additional lb/hr limit to the startup and shutdown BACT limits for the units at this facility.

The source requested the lb/hr startup and shutdown limits based on the ppmvd limits for the units, converted to lb/mmBtu based on Method 19, Equation 19-1 and the maximum heat input rate for the unit. The requested lbs/hr limit are shown in the table below:

Existing Limit	Unit Heat Input Rate* (mmBtu/hr)	Requested Limit (lbs/hr)
NO <sub>x</sub> S/U & S/D 60 ppmvd @15% O <sub>2</sub> (0.2210 lb/mmBtu)	720	159.1
CO S/U 360 ppmvd @ 15% O <sub>2</sub> (0.8073 lb/mmBtu)	720	580.8
CO S/U 350 ppmvd @ 15% O <sub>2</sub> (0.7849 lb/mmBtu)	720	564.7

\*heat input rate for turbine and duct burner combined

The source's proposed lb/hr emission limits are based on the maximum heat input rate of the unit; however, the unit may not be at full load during startup and/or shutdown; therefore, the Division does not necessarily agree with the source's method for setting a lb/hr BACT emission limit. The Division prefers to base this number on actual emission data during startup and shutdown periods.

The source did not submit any startup and shutdown emission data with their March 22, 2006 application and the quarterly excess emission reports only provide emission data in units of ppmvd, not lbs/hr. However, startup and shutdown emission data was submitted in October 2000 to support the addition of startup and shutdown BACT limits in the original Title V permit for this facility. That data included emission data in ppmvd, as well as in lbs/hr. A review of that emission data indicates the highest NO<sub>x</sub> lbs/hr emission rate at 94.5 lbs/hr and the highest CO emission rate at 253.6 lbs/hr. Based on the highest lb/hr emission rates from each of the 31 startups and shutdowns in the October 2000 submittal, only 1 exceeded 90 lbs/hr for NO<sub>x</sub> and 7 exceeded 200 lbs/hr for CO (the average value of those 7 was 223 lbs/hr). Therefore, the Division will set the lbs/hr limit for NO<sub>x</sub> at 90 lbs/hr and CO at 223 lbs/hr.

The request to revise the startup and shutdown BACT limits will result in an increase in the short-term emission rates during certain operating conditions, which are typically short in duration. Based on past modeling analyses conducted for this facility, these increases are not expected to cause or contribute to a violation of the national ambient air quality standards (NAAQS) or the Colorado ambient air quality standards (CAAQS). In addition, these increases are not expected to have a significant affect on air quality related values (AQRVs). Therefore, revised modeling is not warranted for the revised startup and shutdown BACT limits.

#### Insignificant Activity List (Appendix A)

In their May 14, 2008 comments on the draft permit, the source submitted a revised insignificant activity list. This list has been included in the permit.

#### **Other Modifications**

In addition to the source requested modifications, the Division has included changes to make the permit more consistent with recently issued permits, include comments made

by EPA on other Operating Permits, as well as correct errors or omissions identified during inspections and/or discrepancies identified during review of this renewal.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments to the BIV Generation Company, LLC Renewal Operating Permit. These changes are as follows:

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- It should be noted that the monitoring and compliance periods and report and certification due dates are shown as examples. The appropriate monitoring and compliance periods and report and certification due dates will be filled in after permit issuance and will be based on permit issuance date. Note that the source may request to keep the same monitoring and compliance periods and report and certification due dates as were provided in the original permit. However, it should be noted that with this option, depending on the permit issuance date, the first monitoring period and compliance period may be short (i.e. less than 6 months and less than 1 year).
- Added language specifying that the semi-annual reports and compliance certifications are due in the Division's office by the due date and that postmarks cannot be used for purposes of determining the timely receipt of such reports/certifications.

#### General

- The Reg 3 citations were revised throughout the permit, as necessary, based on the recent revisions made to Reg 3.

#### Section I – General Activities and Summary

- Revised the language in Condition 1.1. Since the units have been operating solely as combined cycle units for years, the discussion regarding the conversion to combined cycle units has been removed. Note that the startup dates of the various modes of operation are included in the table in Condition 6.1. In addition, some minor changes were made to the facility location description and to the operation in simple cycle mode based on comments on the draft permit that the source submitted on May 14, 2008.
- Revised the language in Condition 1.4 to add Section V, Condition 3.g as a state-only requirement. In addition the reference to Section II, Condition 1.16 was revised to 1.12, because of renumbering of permit conditions due to the removal of some permit conditions.
- In addition, Section V, condition 3.d was added as a state only condition in Condition 1.4. Note that Section V, Condition 3.d (affirmative defense provisions for excess emissions during malfunctions) is state-only until approved by EPA in the SIP.

- Minor revisions to the language in Condition 3.1 were made to be more consistent with other permits. In addition, added the operating permit issued for the boilers at the Brush Cogeneration Facility (Brushco Farms, 07OPMR299) to the list in Condition 3.2.
- Based on comments made by EPA on another operating permit, the phrase “Based on the information provided by the applicant” was added to the beginning of Condition 4.1 (112(r)).
- Added a column to the Table in Condition 6.1 for the startup date of the equipment. In the addition, the column for “Emission Unit Number” was removed and the “facility identifier” for the turbines were changed from “S004 and S005” to “GT-4 and GT-5”.

#### Section II.1 – Turbines and Duct Burners

- Added some language under the header for the table indicating that the unit can be run in combined cycle mode without the duct burner firing fuel. In addition a note was added to Condition 1.2.3 indicating the PM emission limit if the unit is operated in combined cycle mode without the duct burner firing during.
- Removed the language from Condition 1.1.1.2 (CO BACT) that specifies that good combustion practices constitute monitoring and control of several operating parameters and requiring that such parameters be identified, documented, maintained and made available to the Division. Since compliance with the CO BACT emission limitation is monitored with a CEMS, identification and recording of such parameters is not necessary, since compliance is measured directly with the CEMS.
- Removed the emission limitations indicated as “prior to May 1, 2002”.
- The numbering convention was revised for NSPS Da and there have been some changes to citations numbers due to the insertion of new requirements, therefore, these changes, as applicable, have been made to the permit.
- The quarterly emission limitations were removed from Conditions 1.4.4 and 1.5.3, since they only apply during the first year of operation after commencing operation as combined cycle units. These units have been operating for several years as combined cycle units.
- Based on EPA’s response to a petition on another Title V operating permit, minor language changes were made to various permit conditions (both in the table and the text) to clarify that only natural gas is used as fuel for permit conditions that rely on fuel restriction for the compliance demonstration.
- As indicated in the Division’s August 16, 2005 inspection report, a performance test was conducted for PM on April 22, 2002 to demonstrate compliance with the NSPS Da PM limit for the duct burners; therefore, the performance test requirement was

removed from Condition 1.2.4. Note that the results of the test were 0.009 lb/mmBtu for Brush 4 (4A) and 0.007 lb/mmBtu for Brush 5 (4B), which is well below the NSPS Da PM limit of 0.03 lb/mmBtu. The results are also below the levels seen in the January 2000 performance test which was conducted for simple cycle operation (turbine only) of 0.0184 lb/mmBtu for Brush 4 (4A) and 0.0087 lb/mmBtu for Brush 5 (4B) and were included in the permit as emission factors.

- Removed Condition 1.7 (certify compliance with combined cycle operation), since this requirement has been completed (first semi-annual report submitted after combined cycle operation begins, serves as the self-certification).
- As discussed previously under “Source Requested Modification”, the Division has removed the NSPS Da NO<sub>x</sub> limit (Condition 1.4.2) and included it in Section IV.3 of the permit (streamlined conditions). In addition the CEMS requirements associated with the NSPS Da NO<sub>x</sub> limit (Condition 1.9) were also removed from the permit. Note that they have not been included as a streamlined condition because as discussed previously under “Source Requested Modification” a NO<sub>x</sub> CEMS was not required to duct burners.
- Removed Condition 1.11.1 (determine Btu content of gas). In their comments on the draft permit, the source requested that they be allowed to determine the Btu content of the gas in accordance with 40 CFR Part 75. In lieu of including several options for determining the heat content, the Division added language to Condition 1.2.1 (calculating PM, PM<sub>10</sub> and VOC emissions) requiring the source to use the heat input determined from the data acquisition and handling system (DAHS) from the continuous emission monitoring systems to calculate emissions.
- The performance test requirements (Condition 1.13) were removed from the permit. The performance test requirements applied to the NSPS Da NO<sub>x</sub> and PM limits. As discussed above the performance test for the PM limits were conducted on April 22, 2002 and the results were less than 50% of the standard. The performance test requirements for the NO<sub>x</sub> limits, specified use of the NO<sub>x</sub> CEMS. As discussed previously under “Source Requested Modification”, for duct burners, compliance with the NSPS Da NO<sub>x</sub> limits could be demonstrated with a performance test, rather than a NO<sub>x</sub> CEMS. The source has conducted performance tests to demonstrate compliance with the NSPS Da NO<sub>x</sub> limit in conjunction with recent relative accuracy test audits (RATAs) conducted for the NO<sub>x</sub> CEMS (for instance August 3, 2006 Brush 4/4A – 0.81 lb/MW-hr and Brush 5/4B – 0.82 lb/MW-hr and July 11, 2007 – Brush 4/4A – 0.71 lb/MW-hr and Brush 5/4B – 0.77 lb/MW-hr). Therefore, no further performance testing is required.
- Removed the requirement from Condition 1.18 to submit a copy of the annual certification to the Division. As a result of revisions to the Acid Rain Program made with the Clean Air Interstate Rule (final published in the federal register on May 12, 2005), annual compliance certifications are no longer required, beginning in 2006. The annual certification required for the Title V permit will serve as the compliance indicator for the Acid Rain provisions of the permit.

- The construction permit included requirements to monitor the load at which the turbine and duct burner were operating at and it also specified that the exhaust flow rate and moisture content may be parametrically monitored and that procedure and accuracy shall conform to 40 CFR Part 60. The requirements to monitor the exhaust flow rate and load were streamlined out of the permit in favor of some NSPS Da monitoring requirements (Conditions 1.9.1 and 1.9.2 of the permit). Since the NSPS Da NO<sub>x</sub> limit is being streamlined and the monitoring requirements removed, the requirements to monitor the load and exhaust flow from the construction permit will be included in the permit. These requirements will be added in Condition 1.8 and will specify that load to be measured is in MW. However, since these units are subject to Part 75, the permit will specify that the procedure and accuracy shall conform to 40 CFR Part 75.
- Revisions were made to the requirements in NSPS Subpart GG (published in the federal register on July 8, 2004). These revisions provided additional monitoring options for NO<sub>x</sub> emissions and nitrogen and sulfur content of fuel that have been previously approved by EPA as alternative monitoring. The revised NSPS allows sources to use a NO<sub>x</sub> CEMS in lieu of monitoring the water to fuel ratio, does not require monitoring of the nitrogen content of the fuel if the source has not taken credit for fuel-bound nitrogen in their NO<sub>x</sub> emission limit and does not require that fuel be sampled for the sulfur content if natural gas is used as fuel. In general, most of the NSPS GG monitoring requirements had been streamlined from the permit (in Section IV.3) since other requirements were considered more stringent. No changes to the permit are necessary in Section II.1. Note that other changes will be made to the permit shield for streamlined conditions (Section IV.3) of the permit.

## Section II.2 – Cooling Tower

- In the table title, “S006” was replaced with “CT01” to be consistent with the tables in Section I, Condition 6.2 and the tables in Appendices B and C. In addition, this change was made in Section III.1 (permit shield for non-applicable requirements).
- Removed the monthly emission and water circulation limits (Condition 2.1 and 2.2), since they only apply during the first year of operation and this unit has been operating for several years.
- Based on comments on the draft permit submitted by the source on May 14, 2008, the reference to “hours of operation: in the equation in Condition 2.2 was changed to “pump run time”.
- Removed Conditions 2.4 (commence construction), 2.5 (startup notice) and 2.6 (self-certification). Since the unit has been operating for more than several years, these requirements have been fulfilled and no longer apply.
- Revised the opacity language in Condition 2.7 to more closely match the language in Reg 1.

### Section II.3 – Continuous Emission Monitoring Systems

- Removed the language related to opacity in Condition 3.2.1, since the unit is not subject to any opacity requirements under 40 CFR Part 60.
- Removed the language related to the continuous opacity monitoring system (COMS) in Condition 3.2.2, since natural gas fired units are not required to installed continuous opacity monitoring systems (per 40 CFR Part 75 § 75.14(c)).
- Removed Conditions 3.3 and 3.6, as these apply to the NSPS Da NO<sub>x</sub> limit and as discussed previously under “Source Requested Modification” a NO<sub>x</sub> CEMS was not required for duct burners.
- Condition 3.4 (data replacement requirements) was removed from the permit. The Division’s Field Service’s Unit considers that this requirement is not necessary; therefore it has been removed from the permit. Note that the source is still required to follow the monitoring requirements in 40 CFR Part 75 for purposes of the Acid Rain program (Section III of the permit) and as such are required to replace data as specified in 40 CFR Part 75 for purposes of reporting emission data for that program.

### Section III – Acid Rain Provisions

- Revised the information on the designated representative (DR) and alternate designated representative (ADR).
- Added a requirement to Section 1 (directly under ADR and DR), specifying that changes to the DR and ADR shall be made according to 40 CFR Part 72 § 72.23.
- Revised the table to include calendar years corresponding to the relevant permit term for the renewal.
- Minor changes were made to the standard requirements, based on changes made to 40 CFR Part 72 § 72.9.
- Removed the requirement to submit the annual compliance certification in Section 4 (Reporting Requirements). As a result of revisions to the Acid Rain Program made with the Clean Air Interstate Rule (final published in the federal register on May 12, 2005), annual compliance certifications are no longer required, beginning in 2006.

### Section IV – Permit Shield

- The citation for the permit shield has been revised to make corrections (Part C, Section XIII, should be XIII.B), to reflect revisions and restructuring of Reg 3 and to remove Reg 3, Part C, Section V.C.1.b and C.R.S. § 25-7-111(2)(I) since they don’t address the permit shield.

- Corrections were made to the table in Section 3 (streamlined conditions) under the column “permit condition” to reflect the re-numbering of various permit conditions.
- Added the NSPS Da NO<sub>x</sub> limit to the table in Section 3. As discussed previously, the NSPS Da NO<sub>x</sub> limit was streamlined in favor of the more stringent NO<sub>x</sub> BACT limits.
- Removed the construction permit requirements to monitor the exhaust gas flow and load from the table in Section 3 (streamlined conditions) as they have been included in Section II.1 of the permit. They were streamlined out of the permit in favor of the NSPS Da NO<sub>x</sub> monitoring requirements, which are no longer included in the permit, since the NSPS DA NO<sub>x</sub> limit was streamlined in favor of the more stringent NO<sub>x</sub> BACT limits.
- The permit shield for streamlined conditions (Section 3) was revised to address changes to NSPS GG (final revisions published in the federal register on July 8, 2004). To that end, the following revisions were made:
  - Removed the second line (§ 60.334(a) continuous monitoring system to measure and record fuel consumption rate and ratio of water to fuel), the NSPS allows the use of a NO<sub>x</sub> CEMS in lieu of monitoring the water to fuel ration. In addition, the NO<sub>x</sub> CEMS can meet the provisions of 40 CFR Part 75; therefore, no streamlining is required.
  - In the third line, second column of the table, the citation for § 60.334(b) was replaced with § 60.334(h)(3) and the references to §§ 60.335(d) & (e) were removed. The description in the brackets was changed to indicate the requirement is to monitor the sulfur content of the fuel.
  - In the fourth line, second column of the table, the citation for § 60.334(c)(1) was replaced with § 60.334(j)(1)(iii). The description in the brackets was changed to indicate the requirement is NO<sub>x</sub> excess emission reporting.
  - The fifth line was removed. Excess emission reporting is only required if a source is required to monitor the sulfur content of the fuel. Sources using natural gas as fuel are not required to monitor the sulfur content of the fuel.

#### Section V – General Conditions

- Revisions were made to the Common Provisions Regulation (general condition 3), effective September 30, 2002. The appropriate revisions were made to the language in the permit.
- The upset requirements in the Common Provisions Regulation (general condition 3.d) were revised December 15, 2006 (effective March 7, 2007) and the revisions were included in the permit. Note that these provisions are state-only enforceable until approved by EPA into Colorado’s state implementation plan (SIP).



- Added an “and” between the Reg 3 and C.R.S. citations in General Condition 4 (compliance requirements).
- Replaced the reference to “upset” in Condition 5 (emergency provisions) and 21 (prompt deviation reporting) with “malfunction”.
- The citation in General Condition 17 (open burning) was revised. The open burning requirements are no longer in Reg 1 but are in new Reg 9. In addition, changed the reference in the text from “Reg 1” to “Reg 9”.
- General Condition No. 21 (prompt deviation reporting) was revised to include the definition of prompt in 40 CFR Part 71.
- Replaced the phrase “enhanced monitoring” with “compliance assurance monitoring” in General Condition No. 22.d.

#### Appendices

- Appendix B and C were replaced with latest version.
- EPA’s mailing address was revised (Appendix D). Removed the Acid Rain addresses in Appendix D, since annual certification is no longer required and submittal of quarterly reports/certifications is done electronically.

### Total HAP Emissions (tons/yr) from Brush Cogeneration Facility - Based on Highest Emission Factor for Turbines\*

Emission Unit	formaldehyde	acetaldehyde	toluene	benzene	acrolein	xylene	chloroform	hexane	Dichloro-benzene	nickel	cadmium	chromium	propylene	Total
BCP - Turbine	2.19	0.20	0.56	0.14	0.03	0.10								3.22
BCP - DB	0.02		9.76E-04	6.03E-04				0.52	3.44E-04	6.03E-04	3.16E-04	4.02E-04		0.54
BCP - engine	3.23E-04	2.10E-04	1.12E-04	2.56E-04	2.53E-05	7.81E-05							7.07E-04	1.71E-03
Brushco - Blrs	3.75E-03		1.70E-04	1.05E-04				0.09	6.00E-05	1.05E-04	5.50E-05	7.00E-05		0.09
BCP - Cool Twr							0.38							0.38
CPP - Turbines	6.73	0.14	0.42	0.49	0.02	0.07								7.87
Brushco - Blrs	0.01		3.91E-04	2.42E-04				0.21	1.38E-04	2.42E-04	1.27E-04	1.61E-04		0.22
CPP- Engines	3.23E-04	2.10E-04	1.12E-04	2.56E-04	2.53E-05	7.81E-05							7.07E-04	1.71E-03
CPP - Cool Twr							0.15							0.15
BIV - Turbines	4.95	0.10	0.31	0.36	0.02	0.05								5.69
BIV - Cool Twr							0.43							0.43
<b>Total</b>	<b>13.90</b>	<b>0.34</b>	<b>1.29</b>	<b>0.99</b>	<b>0.07</b>	<b>0.22</b>	<b>0.96</b>	<b>0.82</b>	<b>5.42E-04</b>	<b>9.50E-04</b>	<b>4.98E-04</b>	<b>6.33E-04</b>	<b>1.41E-03</b>	<b>18.60</b>

\*Turbine emission factors from AP-42, CATEF and EPA's 8/22/03 Memo - for all but BCP benzene and acrolein emissions, most conservative emissions are based on EPA Memo. BCP benzene and acrolein emissions based on CATEF.

The heating value of natural gas was presumed to be 1020 Btu/scf and the heating value of diesel was presumed to be 137,000 Btu/gal

Since the turbines have the highest HAP emissions, for CPP and BIV, HAP emissions are based on the turbine only. For BCP, because of the higher fuel limit, the turbine runs 8760 hrs/yr and the duct burner for the remainder.

HAP emissions from the BIV turbines are based on the annual hours of operation multiplied by the design heat rate.